CLAIMS

1. A process for compressing air comprising:

- chilling air to between the dew point and the frost point;
- collecting the resulting condensate;
- injecting the condensate into the chilled air in the form of very small droplets; and
- compressing the chilled droplet laden air.

2. The process according to claim 1 wherein said droplets are predominantly in the size range of 5 to 40 microns - normally referred to as fog.

3. The process according to claim 2 wherein said chilling is to a temperature below about 5°C.

4. The process according to claim 2 additionally comprising combusting a fuel with said compressed air; and work expanding the resulting hot compressed combustion products.

5. The process according to claim 2 additionally comprising supplying said chilling by an absorption refrigeration unit (ARU).

6. The process according to claim 5 additionally comprising combusting a fuel with said air and work expanding the resulting hot combustion products; and supplying heat to said ARU from said work expander exhaust.

7. The process according to claim 6 wherein said ARU is an ammonia-absorption type, and additionally comprising supplying ARU ammonia refrigerant directly to an air coil for said chilling step; and providing exhaust heating directly to the ARU absorbent.

8. The process according to claim 2 additionally comprising partially compressing said chilled air prior to injecting said fog droplets.

9. The process according to claim 2 additionally comprising refrigerating said chilled air to below the frost point before injecting fog.

RCT

10. An apparatus for ~~increasing~~ INCREASING the capacity and efficiency of ~~air~~ AN AIR compressor comprising:

- a means for air chilling which is supplied with a refrigerant;
- a condensate collection system for condensate condensed from said air by said means for chilling;
- a means for converting said condensate into fog-sized droplets;
- a means for injecting said droplets into said air downstream of said chilling means; and
- a duct for supplying said chilled and fogged air to the suction of said air compressor.

11. The apparatus according to claim 10 wherein said means for air chilling is comprised of refrigerated air coils.

12. The apparatus according to claim 11 additionally comprised of an ARU which supplies refrigerant directly to said air coils.

13. The apparatus according to claim 12 wherein said ARU is comprised of NH_3 - H_2O working fluid, and a heat exchanger between said working fluid and a combustion exhaust gas.

14. The apparatus according to claim 13 wherein said combustion exhaust gas is from a combustion engine which is supplied by said air compressor.

15. The apparatus according to claim 14 wherein said combustion engine is a reciprocating engine.

16. The apparatus according to claim 14 wherein said combustion engine is a combustion turbine.

17. The apparatus according to claim 16 wherein said combustion turbine includes a regenerator.

Sub A1

18. The apparatus ~~accoreing~~ according to claim 10 additionally ~~comprised of~~ comprised of a LiBr ARU which supplies said chilling.

19. An apparatus for increasing the efficiency of a combustion turbine comprising:

a) a chiller for the inlet air for the combustion turbine which chills said air to below the dew point;

b) a collector for condensate from said chiller; and

c) a system for injecting said condensate into said chilled air in the form of fog-sized droplets.

20. The apparatus according to claim 19 additionally comprised of an ARU which supplies cooling to said chiller and which is supplied waste heat from said combustion turbine exhaust; and at least one of:

a) a heat recovery steam generator; and

b) a regenerator.